

REMARKS

Claims 1, 2, 5-8, 11, 12, 14-16 and 21-26 are pending herein.

By this Amendment, the title is amended as requested by the Patent Office. Also, claims 1, 8, 14 and 15 are each amended to recite that the lateral surface of the semiconductor chip is a surface that is substantially perpendicular to the surface of the semiconductor chip on which the electrodes are formed. These amendments are made to better specify which surface of the semiconductor chip is a lateral, or side, surface. No new matter is added by these amendments, support being found in the original specification at least at, for example, Figure 5B and the corresponding description in the specification. Finally, new claims 23-26 are added.

In view of the foregoing amendments and the following remarks, reconsideration of this application is respectfully requested.

I. Objection to the Title

The title of the application was objected to as allegedly being not descriptive.

By this Amendment, the title has been amended in an effort to address this objection. Applicant respectfully submits that the amended title is adequately descriptive of the claimed invention. Accordingly, reconsideration and withdrawal of this objection are respectfully requested.

II. Rejection Under 35 U.S.C. §102(e)

Claims 8, 11, 14-16, 21 and 22 were rejected under 35 U.S.C. §102(e) as allegedly being anticipated by U.S. Patent No. 5,804,882 (Tsukagoshi). This rejection is respectfully traversed.

In each of independent claims 8, 14 and 15, it is required (1) that the adhesive, interposed between a surface of the substrate on which an interconnect pattern is formed and a surface of a semiconductor chip in which electrodes are formed, have conductive particles

dispersed therein, and (2) that the adhesive cover substantially all area of lateral (i.e., side) surfaces of the semiconductor chip that is substantially perpendicular to the surface of the semiconductor chip on which the electrodes are formed. Applicant respectfully submits that Tsukagoshi completely fails to teach or suggest a semiconductor device, circuit board or electronic instrument in which the adhesive joining the semiconductor chip and the interconnect pattern substrate be made to cover substantially all area of lateral surfaces of the semiconductor chip.

In the Office Action, it was alleged that Tsukagoshi described a semiconductor device that fully anticipated the semiconductor device of claim 8, the circuit board of claim 14 and the electronic instrument of claim 15. Applicant respectfully disagrees.

As was correctly summarized in the Office Action, Tsukagoshi describes a semiconductor device in which a semiconductor chip 1 having electrodes 2 thereon can be joined to a substrate 4 having circuits 5 and projecting electrodes 7 thereon by way of an adhesive 11 that includes electroconductive particles 12. However, as clearly shown in Figures 1-4 and 9 of Tsukagoshi, in none of the embodiments of Tsukagoshi is it taught or suggested that the adhesive must be made to cover substantially all area of lateral surfaces of the semiconductor chip 1 that is substantially perpendicular to the surface of the semiconductor chip 1 on which the electrodes 2 are formed. In Figures 1-4 of Tsukagoshi, the adhesive is shown to cover none of the lateral surfaces of the semiconductor chip 1. In Figure 9, Tsukagoshi illustrates that the adhesive at best covers only a very minor portion of a lateral surface of the semiconductor chip 1.

Thus, nowhere in Tsukagoshi is it taught or suggested that the adhesive 11 including electroconductive particles 12 therein must be made to cover substantially all area of lateral surfaces of the semiconductor chip 1 as required in the presently claimed invention (and shown in, for example, Figure 5B of the present specification).

For at least the foregoing reasons, Applicant respectfully submits that Tsukagoshi neither teaches nor suggests the presently claimed invention. Reconsideration and withdrawal of this rejection are respectfully requested.

III. Rejection Under 35 U.S.C. §102(f) and (g)

Claims 8, 11, 12, 14-16, 21 and 22 were rejected under both 35 U.S.C. §102(f) and 35 U.S.C. §102(g) relying upon the teachings and claims of U.S. Patent No. 6,528,889 (Matsuhira). This rejection is respectfully traversed.

On pages 4 and 5 of the Office Action, it was alleged that the teachings and claims of Matsuhira fully described and recited the invention of the present claims, and thus allegedly evidenced that the present applicant did not invent the claimed subject matter. However, Applicant respectfully submits that Matsuhira suffers from the same deficiencies as Tsukagoshi discussed above.

Specifically, Matsuhira describes an electronic circuit device in which a semiconductor chip 4 having electrodes 8 thereon is bonded to a substrate 2 having a pattern 2 thereon by way of an adhesive film 5 having electroconductive particles 9 therein. Matsuhira describes that inclusion of an adhesion-reinforcing pattern 3 upon the substrate 1 between portions of the pattern 2 increases the adhesive bond between the semiconductor chip and the substrate so as to avoid breakage of the joint between the semiconductor chip and the circuit board. See column 1, line 64, to column 2, line 13 and column 2, line 44 to column 3, line 7 of Matsuhira.

However, like Tsukagoshi discussed above, nowhere does Matsuhira teach or suggest that the adhesive film 5 including electroconductive particles therein must be made to cover substantially all area of lateral surfaces of the semiconductor chip 4 that is substantially perpendicular to the surface of the semiconductor chip 4 on which the electrodes 8 are formed. As best shown in Figures 1 and 3 of Matsuhira, an electronic circuit device is shown

in which the adhesive material does not cover substantially all area of lateral surfaces of the semiconductor chip 4. Rather, at best, Matsuhira illustrates that the adhesive film covers only a very minor portion of a lateral surface of the semiconductor chip 4.

Thus, nowhere does Matsuhira teach or suggest the presently claimed invention. Matsuhira thus also neither claims the present invention nor evidences that Applicant did not invent the claimed invention.

For at least the foregoing reasons, Applicant submits that Matsuhira does not anticipate the presently claimed invention. Reconsideration and withdrawal of this rejection are respectfully requested.

IV. Rejection Under 35 U.S.C. §103(a)

Claim 12 was rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Tsukagoshi in view of U.S. Patent No. 5,783,465 (Canning). This rejection is respectfully traversed.

The Patent Office relied upon Canning as allegedly teaching including a shading pigment in the adhesive of Tsukagoshi. However, even if this were accepted, the teachings of Canning nowhere remedy the extensive deficiencies of Tsukagoshi discussed above. That is, Canning also fails to teach or suggest providing an adhesive having conductive particles dispersed therein and being configured to cover substantially all area of lateral surfaces of a semiconductor chip.

For at least the foregoing reasons, Applicant respectfully submits that neither Tsukagoshi nor Canning, whether taken singly or in combination, teaches or suggest the claimed invention. Reconsideration and withdrawal of this rejection are respectfully requested.

V. Rejoinder

Applicant submits that as non-elected claims 1, 2 and 5-7 are directed to a method of making the semiconductor device of claim 8, these non-elected claims must be rejoined with the application and allowed with the application upon allowance of claim 8. Therefore, upon allowance of claim 8, rejoinder of presently non-elected claims 1, 2 and 5-7 is respectfully requested.

VI. Conclusion

In view of the foregoing amendments and remarks, Applicant submits that claims 1, 2, 5-8, 11, 12, 14-16 and 21-26 are in condition for allowance.

Should the examiner believe that anything further is necessary in order to place the application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



James A. Oliff
Registration No. 27,075

Christopher W. Brown
Registration No. 38,025

JAO:CWB/rav

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OLIFF & BERRIDGE, PLC
P.O. Box 19928
Alexandria, Virginia 22320
Telephone: (703) 836-6400

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